ANALYSIS OF AIR ACCIDENTS BY DECADES

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Project Overview:

TOPIC

Analyzing historical air crash data to understand trends, reasons for accidents and safe protocols helped to decrease accidents

DATASET

Original dataset from the National Transportation Safety Board (NTSB)

HYPOTHESIS

Temporal Trend, Location, and Weather Factors

DATA CLEANING:

Data Cleaning

Filled relevant columns.
Removed irrelevant columns to improve response time.

```
# List of tuples containing the columns and functions to be ap
columms_func = [
    ('Total.Fatal.Injuries', defs.fill0),
    ('Total.Uninjured', defs.fill0),
    ('Total.Serious.Injuries', defs.fill0),
    ('Total.Minor.Injuries', defs.fill0),
    ('Weather.Condition', lambda x: defs.fillstr(x, "UNK")),
    ('Event.Date', defs.tpdate),
    ('Total.Fatal.Injuries', defs.tpint),
    ('Total.Serious.Injuries', defs.tpint),
    ('Total.Minor.Injuries', defs.tpint),
    ('Total.Uninjured', defs.tpint)
]

# Applying the functions to the DataFrame columns
for columms, func in columms_func:
    data[columms] = func(data[columms])

# Replace to standardize
data['Injury.Severity'] = data['Injury.Severity'].str.replace(
data['Weather.Condition'] = data['Weather.Condition'].replace(
```

1

Challenges

Addressing missing data, duplicates, and formatting issues.

2

3

Formatting Methods

Explored formatting techniques for data readability and consistency

EXPLORATORY DATA ANALYSIS

1

TEMPORAL TREND

Investigating if aviation safety has improved over time, evidenced by a decrease in accident frequency.

2

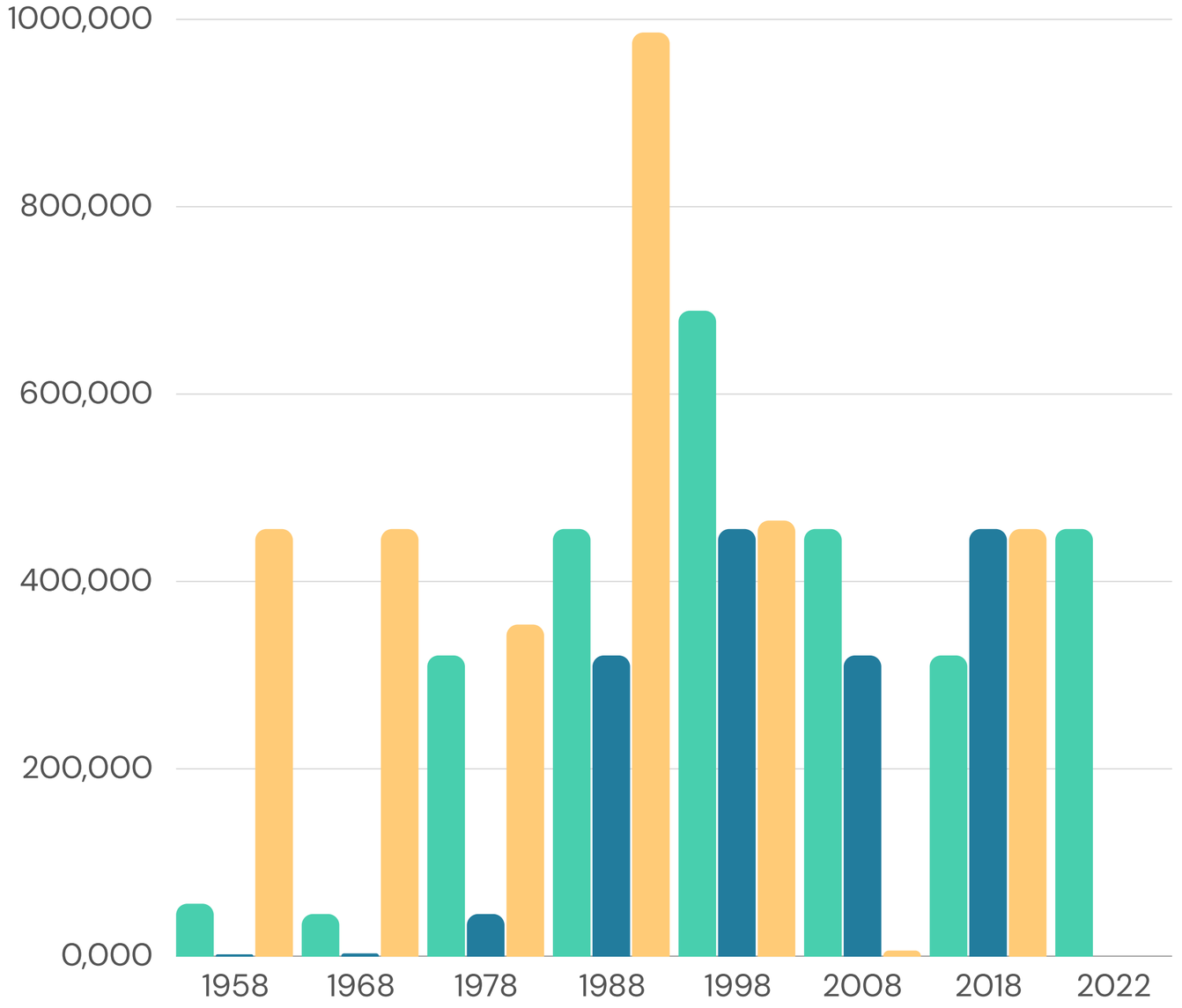
LOCATION

Examining if certain geographic regions have a higher incidence of accidents due to factors like geographical conditions, or climatic characteristics.

3

WEATHER FACTORS

Analyzing if adverse weather conditions correlate with increased aviation accidents, such as fog, storms, or strong winds



TEMPORAL TREND

Insights

Decreasing trend in the number of accidents over time, with a peak in 1988-1998 followed by a subsequent decline. This suggests that aviation safety may have indeed improved over the decades.

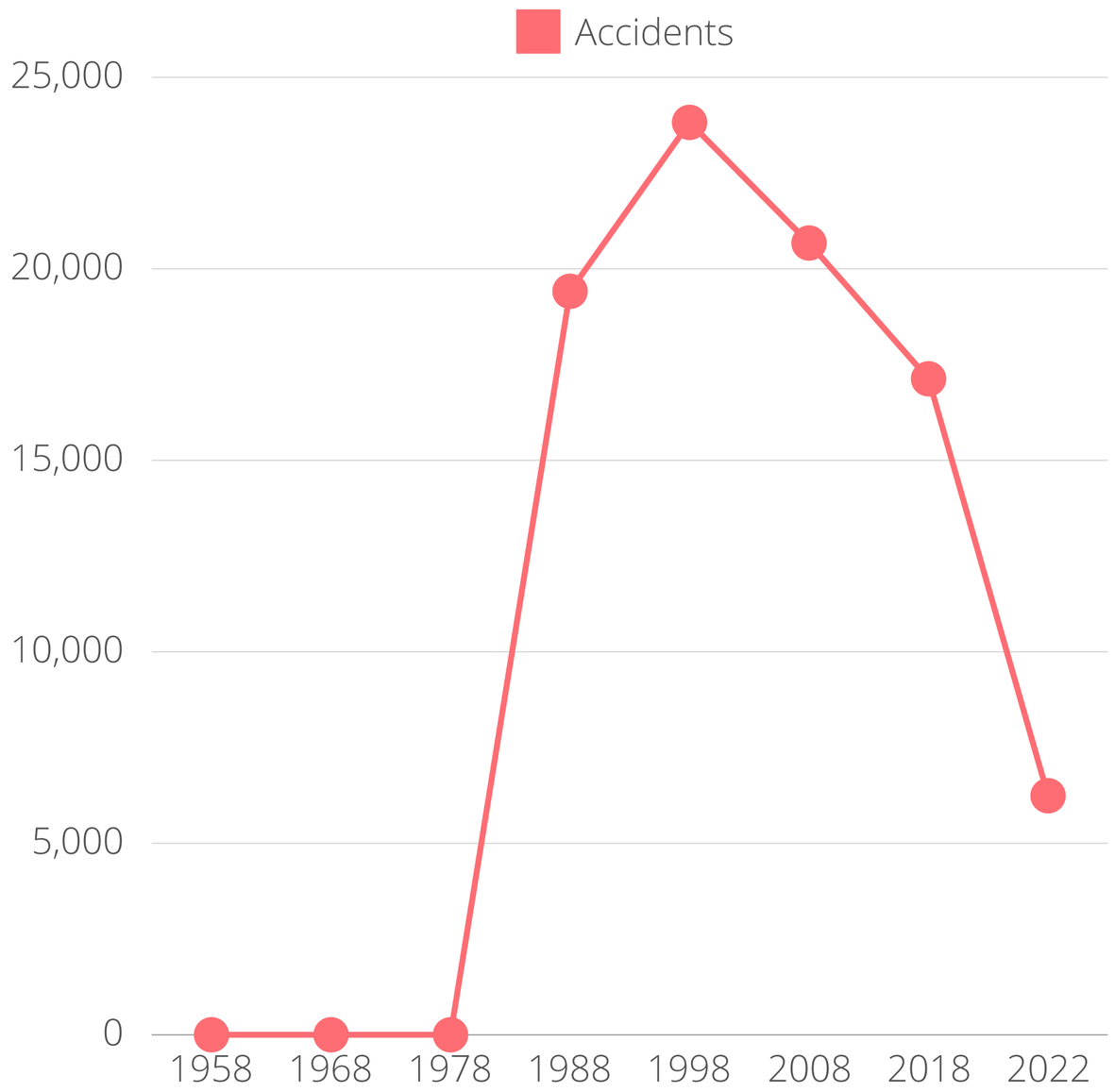
At least 4 protocols were created

Future Analysis

- Conduct in-depth investigations into specific factors contributing to the peak in accidents during 1988-1998.

Recommendation

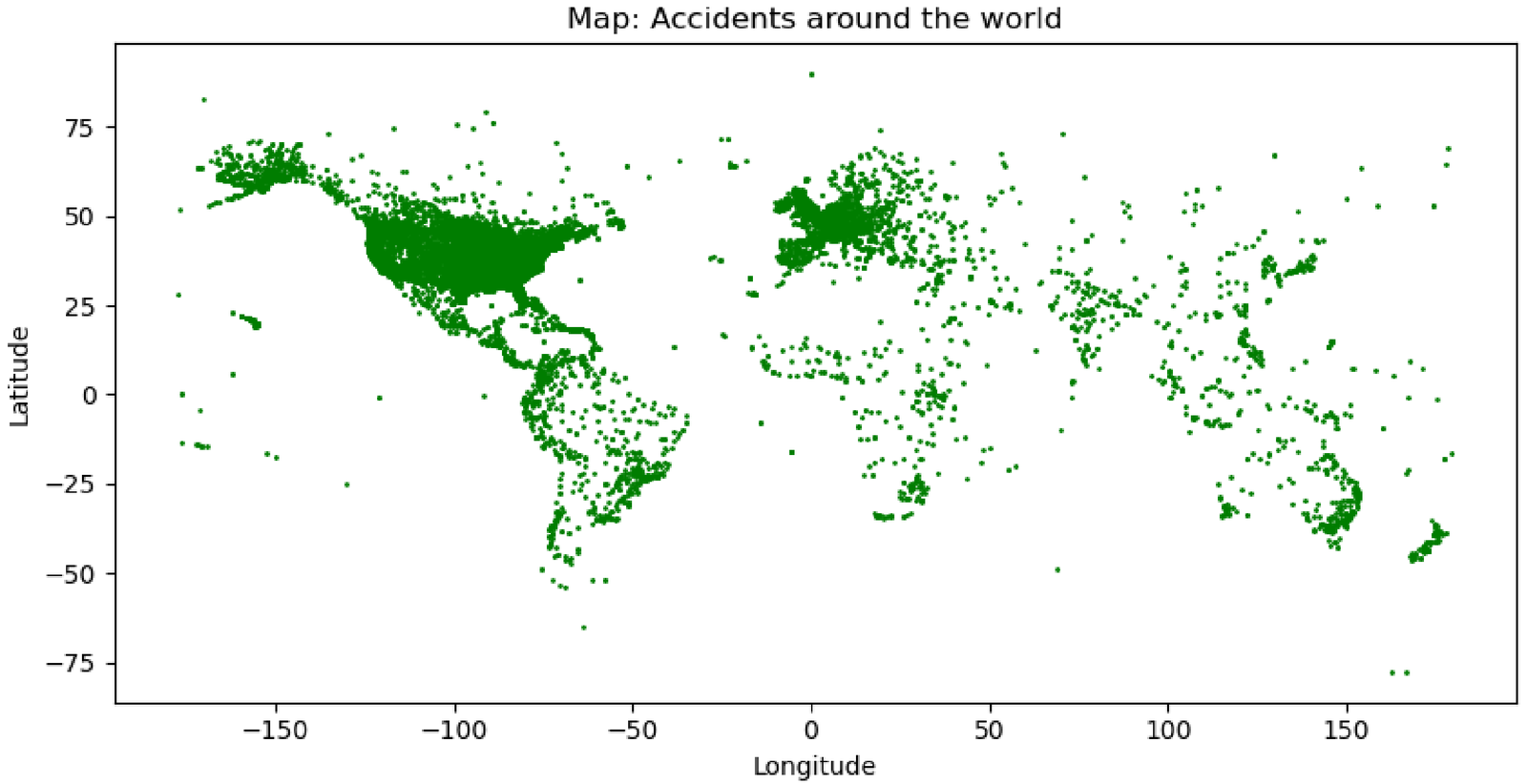
- Continue monitoring and analyzing aviation safety data to stay abreast of emerging trends and address potential safety concerns proactively.



LOCATION

Insights

The United States has by far the highest incidence of aviation accidents compared to other countries listed. This could support the idea that certain geographic regions, such as highly populated areas or regions with specific climatic conditions, are more prone to aviation accidents.



Future Analysis

Analyze factors contributing to higher accident rates in certain areas:

- Population density
- Geographic features
- Weather patterns
- Air traffic volume
- Infrastructure
- Regulatory factors

LOCATION

Only 1,000 of 89,000 accidents

Map created by Folium module

WEATHER FACTORS

Insights

The fact that accident numbers differ in various weather conditions across countries implies that factors such as weather patterns and air infrastructure contribute to these disparities.

Future Analysis

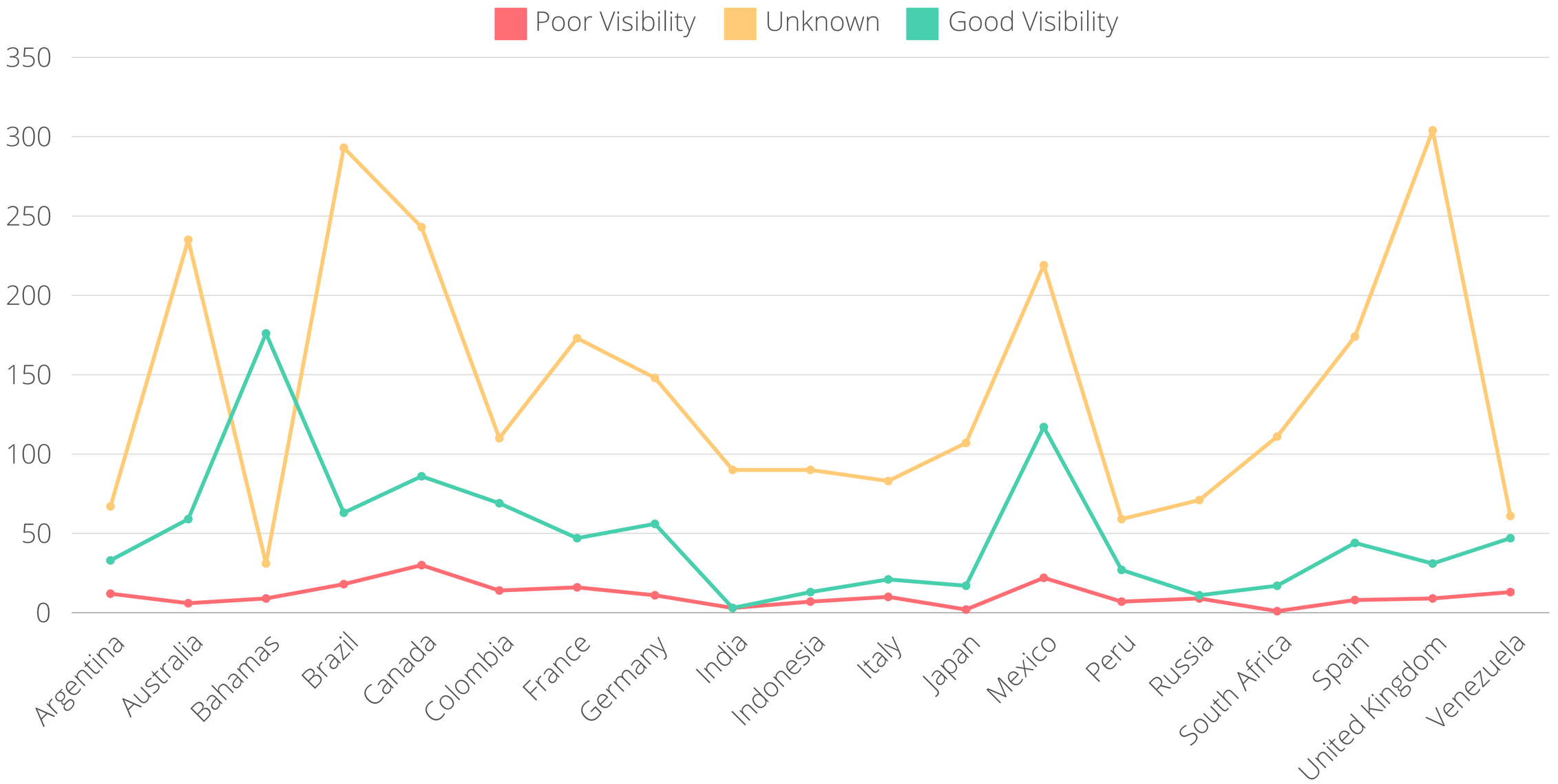
- Poor weather conditions may lead to more air accidents and technologies to handle these hazardous situations.

Recommendation

- Countries with high accident rates in adverse weather should consider enhancing safety protocols. This includes improving navigation systems and pilot training.

Weather.Condition Country	Poor Visibility	Unknown	Good Visibility
Argentina	12	67	33
Australia	6	235	59
Bahamas	9	31	176
Brazil	18	293	63
Canada	30	243	86
Colombia	14	110	69
France	16	173	47
Germany	11	148	56
India	3	90	3
Indonesia	7	90	13
Italy	10	83	21
Japan	2	107	17
Mexico	22	219	117
Peru	7	59	27
Russia	9	71	11
South Africa	1	111	17
Spain	8	174	44
United Kingdom	9	304	31
United States	5618	1313	75317
Venezuela	13	61	47

WEATHER FACTORS



MAJOR OBSTACLE

- Handling replacing and extract data posed significant challenges.
- How to create stackable tables by country, with rows as columns and sums as a good visualization results.

CONCLUSION

This project aims to assess the effectiveness of safety protocols implemented over the years and identify areas for improvement to further enhance aviation safety.

Learnings:

- Identified key factors influencing aviation safety: Air Traffic Density, Population Centers, Regional Variances.
- 4 safety protocols were created and revised in 1959, 1963, 1969, 1975, 1980, 1997, 2000, and 2006.

THANK YOU